
Sensors, Actuators, and Microsystems (General) – 219th ECS Meeting

Editors:

Z. Aguilar

Ocean Nano Tech LLC
Springdale, Arkansas, USA

J. Li

NASA Ames Research Center
Moffett Field, California, USA

A. Simonian

Auburn University
Auburn, Alabama, USA

R. Mukundan

Los Alamos National Laboratory
Los Alamos, New Mexico, USA

V. Lvovich

Cleveland Clinic Foundation
Cleveland, Ohio, USA

N. Wu

West Virginia University
Morgantown, West Virginia, USA

Sponsoring Division:



Sensor



Published by

The Electrochemical Society

65 South Main Street, Building D
Pennington, NJ 08534-2839, USA

tel 609 737 1902

fax 609 737 2743

www.electrochem.org

ecs transactions™

Vol. 35, No. 30

Copyright 2011 by The Electrochemical Society.
All rights reserved.

This book has been registered with Copyright Clearance Center.
For further information, please contact the Copyright Clearance Center,
Salem, Massachusetts.

Published by:

The Electrochemical Society
65 South Main Street
Pennington, New Jersey 08534-2839, USA

Telephone 609.737.1902
Fax 609.737.2743
e-mail: ecs@electrochem.org
Web: www.electrochem.org

ISSN 1938-6737 (online)
ISSN 1938-5862 (print)
ISSN 2151-2051 (cd-rom)

ISBN 978-1-56677-932-6 (PDF)
ISBN 978-1-60768-290-5 (Softcover)

Printed in the United States of America.

Table of Contents

Preface	iii
---------	-----

Chapter 1 Sensors, Actuators, and Fabrication

Toward an Electrolytic Micropump Actuator Design with Controlled Cyclic Bubble Growth and Recombination <i>L. Hsu, J. Ramunas, J. Gonzalez, J. Santiago, and D. G. Strickland</i>	3
Redox-Induced Actuation of Microcantilevers Modified with Ferrocenylalkanethiolate Self-Assembled Monolayers <i>L. Norman, E. R. Dionne, and A. Badia</i>	13
Nano-Link Based Ultra Low Power Micro Electronic Hotplates for Sensors and Actuators <i>A. W. Groenland, R. A. Wolters, A. Y. Kovalgin, and J. Schmitz</i>	25
Low-Temperature Grown High-Quality Piezoelectric AlN Film for Sensor Applications <i>R. Sah, O. Bludau, C. Röhl, L. Kirste, V. Cimalla, and V. Lebedev</i>	35
Low Stress In Situ Boron Doped Poly SiGe Layers for MEMS Modular Integration with CMOS <i>S. Kazmi, T. Aarnink, A. Y. Kovalgin, C. Salm, and J. Schmitz</i>	45
Hybrid Backside Illuminated CMOS Imager for High-End Applications <i>J. De Vos, K. De Munck, M. Erismis, K. Minoglou, P. Rao, W. Zhang, D. Sabuncuoglu Tezcan, P. De Moor, and P. Soussan</i>	53
Evaluation of the Corrosion Behavior in the SAE 1018 Carbon Steel Pipelines that Carry Potable Water Applying Acquisition and Data Processing <i>H. Lara Ordaz, E. Bolaños Rodríguez, and J. Ramírez-Hernández</i>	65
The Effects of Fabrication Process on the Performance of a CMOS Based Capacitive Humidity Sensor <i>N. Saeidi, A. Blake, C. Colinge, M. Burke, A. Quinn, A. Demosthenous, and N. Donaldson</i>	71

Chapter 2 **Gas and Environmental Sensors**

NO _x Sensing with n-type WO ₃ - CuWO ₄ Composites <i>C. M. Gonzalez, M. Post, J. Dunford, and X. Du</i>	81
Miniband-Resonant-Tunneling Optoelectronic Device <i>D. Guo</i>	97
BaSnO ₃ Thick Film as a Carbon Dioxide Sensor <i>L. Cavanagh, P. Smith, and R. Binions</i>	103
Optoelectronic Device with Dual Quantum Wells <i>D. Guo</i>	113
Development of a Miniaturized Gas Ionization Sensor for Harsh Environments by Using Polyimide Spacer <i>T. Walewyns, G. Scheen, E. Tooten, P. Dupuis, and L. A. Francis</i>	119

Chapter 3 **Bio and Nano Sensors**

Fabrication and Modeling of a Novel SAW-Like Transducer Device Based on Branched Carbon Nanotubes <i>S. Darbari, Y. Abdi, A. Ebrahimi, N. Doostani, and S. Mohajerzadeh</i>	131
--	-----

Chapter 4 **Poster Session**

Elastostriiction and Electrostriction in Piezoelectric Transducers Comprising Bulk PZT Ceramics <i>M. Wischke, N. Dieterich, D. Haller, M. Kroener, and P. Woias</i>	139
Effect of the Mixed N ₂ /O ₂ Oxidation Process on Improvement of the Sensitivity of the SiGe Nano-Wire <i>K. Chang, C. Chen, C. Lai, Y. Wang, C. Liu, C. Hsieh, and C. Wu</i>	145
Critical Analysis of Ion Detection Using Semiconductor Field Effect Devices: Consequences for Chemical and Biomedical Applications <i>R. A. Nascimento and M. Mulato</i>	155

Author Index	171
--------------	-----